
IV. *Account of the Gizzard of the Shell called by Linnæus Bulla lignaria, addressed to the President. By Mr. George Humphrey, A. L. S.*

Read Dec. 1, 1789.

SIR,

I HAVE been credibly informed that the late celebrated Dr. Linnæus, when he first began his *Systema Naturæ*, intended to have taken no notice of the *Testacea*; and his reason for it was, that as the animals of the far greater part were unknown, he did not choose to describe their mere houses or shells. However, it is plain that he afterwards altered his mind; and though in his said work he has inserted only a short account of the animal of each genus of the *Testacea* in his characteristic definition thereof, yet there is no doubt but that he would have mentioned any remarkable particulars of that of each species, if he had been acquainted with any: every addition therefore to this interesting part of Conchology, however little, would certainly have been acceptable to that indefatigable Naturalist, and I presume will be equally so to his admirers. To that end give me leave, Sir, to trouble you to lay before the Society bearing his name, the following notes respecting the animal of the *Bulla* genus of *Testacea*.

Some few years past Mrs. Le Coque, who resided at Weymouth, sent up to her Grace the late Duchess Dowager of Portland, a large shell of that species of *Bulla* called by Linnæus *lignaria*, together with a curious internal part, accompanied by the following note:

“ I am

“ I am exceeding forry this shell is broke, as I think I never
 “ met with the sort before: it had the fish in it, and I think it
 “ is as wonderful a thing of the kind as ever I saw. After I had
 “ taken it out I was endeavouring which way to preserve it, but
 “ found I could not succeed, as it was of such a fleshy substance.
 “ On opening it I found the inside to resemble a fowl's; it had a
 “ distinct *heart, liver*, and this that I have sent, which I take to
 “ be the *gizzard*, as your Grace will see by a little shell going into
 “ the inside.”

The *Bulla* and gizzard here mentioned I purchased at the sale of her Grace's Museum for Isaac Swainson, Esq. of Frith-street, Soho; and with his permission have the honour of submitting them to the inspection of the Society, together with another gizzard of the same kind, having the parts separated; accompanied by a coloured drawing of the whole, done by Mr. Lewin; which last I beg may be added to the collection of the Society.

The animal of all the species of the *Bullæ* that we are acquainted with is very large, considering the size of their testaceous part, and but a small part of it can be contained in the shell; Linnæus says it is of the limax or slug kind.

That the part called the gizzard is for the purpose of masticating its food, may be inferred not only from the shell found within that sent by Mrs. Le Coque, but also from an observation since made by John Smith Budgen, Esq. a gentleman very conversant in shells, who informed me, that from a gizzard of an animal of this kind he took a small shell, *Bulla cylindræa* of Pennant, with the animal in it.

The shell found in the gizzard of Mrs. Le Coque's *Bulla* is a small bivalve of the *Mya* genus of Linnæus; and which also accompanies the other specimens. It had the animal in it when taken out. On one of its valves there is the commencement of a circular

lar perforation; which circumstance I mention, as it may possibly throw some light on the cause of the round holes so frequently met with in shells, particularly among the bivalves; which operation has been generally ascribed to shell-fish of the *Purpura* kind. It is probable that the animal of the abovementioned *Bulla* is provided with some organ within the gizzard, for perforating such shells as are too hard to be crushed by the action of the gizzard valves against each other, in order to come at the fish. The shells of this bivalve are thick, and shut close. The animal was entire; and as it seems impossible for such shells to be broken by any force of so small an animal as that of the *Bulla* in question, it is possible that it had begun the perforation above mentioned in order to get at the enclosed meat.

Since this discovery was made, it has been found that the *Bulla aperta* of Linnæus, and *Bulla patula* of Pennant, have similar gizzards to that of the *Bulla lignaria*; and no doubt all the species properly belonging to this genus have like parts.

It is to be hoped, that these observations may induce some able anatomist to give some farther accounts of the animal of the *Bullæ* shells, especially as the abovementioned, with other kinds, are found living on our own coasts.

It only remains for me, Sir, to add a short description of the drawing, TAB. 2.

No. 1. and 2. shew the *Bulla lignaria* in two views, the back and the mouth.

No. 3. 4. and 5. exhibit the gizzard in three different sites. The brown parts between the valves are partly fleshy and partly membranaceous, and connect the valves together: a. is the supposed entrance into the gizzard: b. the part from whence the *Mya* was taken.

The three valves which compose the gizzard, the least of which is placed between the other two, as expressed at No. 4. are of a nature between shell and bone: the two larger, which are similar, are nearly flat. The surface of the outside, No. 6. is smooth, except a large depression in the middle, and glossy. The middle of the inside, No. 7. rises in proportion as the other is depressed, and is rough, as if intended for mastication, which its promi- nency also favours, and it also appears to be hardest there. A yellow gristly substance surrounds this part, with which it is probable the valves are moved; from whence it is finely striated to the edge, which is a little sharp.

No. 8. The least valve appears like one of the others bent out-wards, but so that the two edges do not meet, particularly at the two ends, where they are a little distant, forming a groove widest at the extremities, as seen at No. 4. The inside is rough at the centre, and has the circular gristle-like part that is in each of the other valves.

Other particulars are so well expressed in the drawing, as to need no elucidation.

It may not be amiss to remark, that the *Bulla* is destitute of an operculum; and there is certainly no occasion for one, as the far greater part of the animal is on the outside of the shell, and cannot, on account of its gizzard, contract itself so as to retire within it: but as it resides in deep water, it is perhaps as safe there from fish, crabs, and other depredators, as those are who live nearer the shore, and barricado the mouths of their shells with their opercula.

I am, Sir,

Your obliged and most humble servant,

GEORGE HUMPHREY.

Albion-street, Surry end of Black-
Fryar's Bridge, 1st Dec. 1789.